Appendix B
Regions of the Electromagnetic Spectrum and Useful TM Band Combinations

Spectrum Region	Wavelength range	Use	
UV	0.300 – 0.446 μm	Florescent materials such as hydrocarbons and rocks. Monitor ozone in stratosphere	
Visible - blue	0.446 – 0.500 μm	Soil/vegetation discrimination, ocean productivity, cloud cover, precipitation, snow, and ice cover	Urban features
Visible - green	0.500 – 0.578 μm	Corresponds to the green reflectance of healthy vegetation and sediment in water.	
Visible - red	0.579 – 0.7 μm	Helpful in distinguishing healthy vegetation, plant species, and soil/geological boundary mapping	
Near infrared (NIR)	0.7 – 0.80 μm	Delineates healthy verses unhealthy or fallow vegetation, vegetation biomass, crop identification (near infrared) soil, and rocks	Surface water, snow, and ice
	0.80 – 1.10 μm	Delineates vegetation, penetrating haze and water/land boundary mapping	
Mid-infrared	1.60 – 1.71 μm (SWIR)	Soil and leaf moisture; can discriminate clouds, snow, and ice. Used to remove the effects of thin clouds and smoke	
	2.01 – 2.40 μm	Geologic mapping and plant and soil moisture, particularly useful for mapping hydrothermally altered rocks	
Thermal IR	3.0 – 100 μm	Monitoring temperature variations in land, water, ice, and forest fires (and volcanic fire)	
	6.7 – 7.02 μm	Upper-tropospheric water vapor	
	10.4 – 12.5 μm	Vegetation classification, and plant stress analysis, soil moisture and geothermal activity mapping, cloud top and sea surface temperatures.	
Microwave	1 μm to 1 m	Useful for mapping soil moisture, sea ice, currents, and surface winds, snow wetness, profile measurements of atmospheric ozone and water vapor, detection of oil slicks	

	Color Plane			Applications
	Red	Green	Blue	
Landsat TM Band Combination	3	2	1	True Color. Water depth, smoke plumes visible
	4	3	2	Similar to IR photography. Vegetation is red, urban areas appear blue. Land/water boundaries are defined but water depth is visible as well.
	4	5	3	Land/water boundaries appear distinct. Wetter soil appears darker.
	7	4	2	Algae appear light blue. Conifers are darker than deciduous
	6	2	1	Highlights water temperature.
	7	3	1	Helps to discriminate mineral groups. Saline deposits appear white, rivers are dark blue.
	4	5	7	Mineral differentiation.
	7	2	1	Useful for mapping oil spills. Oil appears red on a dark background.
	7	5	4	Identifies flowing lava as red/yellow. Hot lava appears yellow. Outgassing appears as faint pink.